



ROADRUNNER 98



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AFRL/HEA, 3 - 5 Nov



Overview

- **Distributed Mission Training (DMT) exercise focused on training warfighters to perform composite force missions that are rarely practiced due to cost, safety, and security constraints.**
- **Sponsored by USAF/XOC in cooperation with ACC/DOT**
- **Participants:**
 - **AFRL/HEA - AWACS - 33FW**
 - **TACCSF - NAWC-TSD - Iowa ANG**
 - **AFIWC - 27FW - 355 Wing**
 - **Silicon Graphics Computer Systems**
 - **MultiGen, Inc**

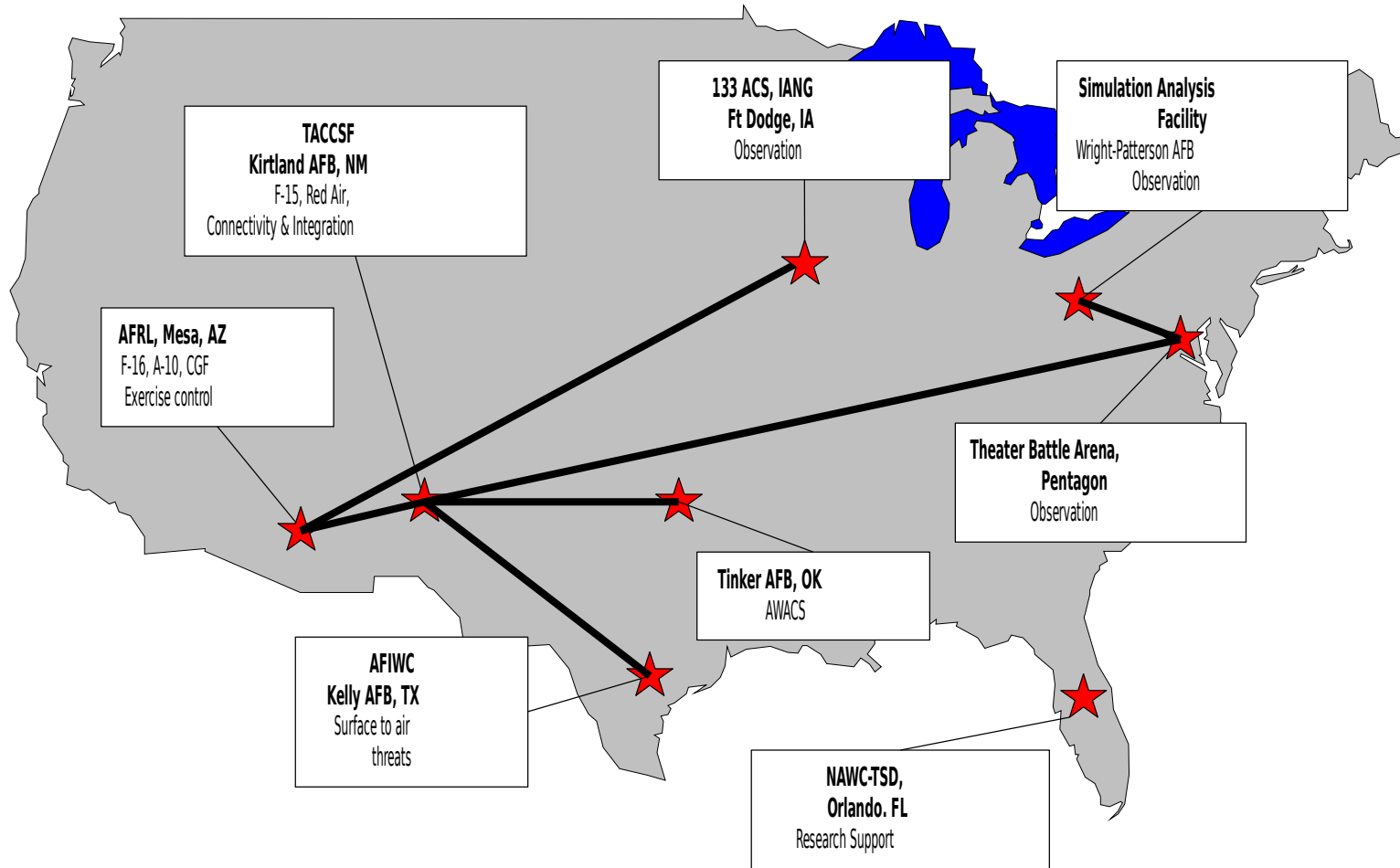


Objectives

- **Conduct a series of composite force missions using virtual and constructive simulations linked over a wide-area net in order to:**
 - **Document DMT technical capabilities necessary for combat mission training**
 - **Validate research approach for DMT training effectiveness studies**



Roadrunner 98 DMT Sites





Roadrunner Entities

- **Virtual simulations**
 - **4 F-16s, AFRL Mesa**
 - **4 F-15s, TACCSF Kirtland AFB**
 - **1 A-10, AFRL, Mesa**
 - **AWACS,**
 - » **2 Weapons Directors plus**
 - » **2 Air Surveillance Technicians**
- **Constructive Simulations**
 - **F-16 Block 50**
 - **F-16 Block 30**
 - **KC-135, E-3**
 - **SA-2, SA-6, SA-8, AAA**
 - **Early warning radars**
 - **MiG-29, Su-27**
 - **M-1, T-72**



Schedule

Mon 13 Jul	Tue 14 Jul	Wed 15 Jul	Thu 16 Jul	Fri 17 Jul
Travel, Inbrief, Question- naires	Test 1: Surface Attack Tactics	Interdic- tion	Supres- sion of Enemy Air Defense: Conven- tional	Test 2: Surface Attack Tactics; Outbrief, Question- naires
Familiari- zation ride	Offensive Counter Air: Air to- Ground	Defensive Counter Air	Close Air Support	

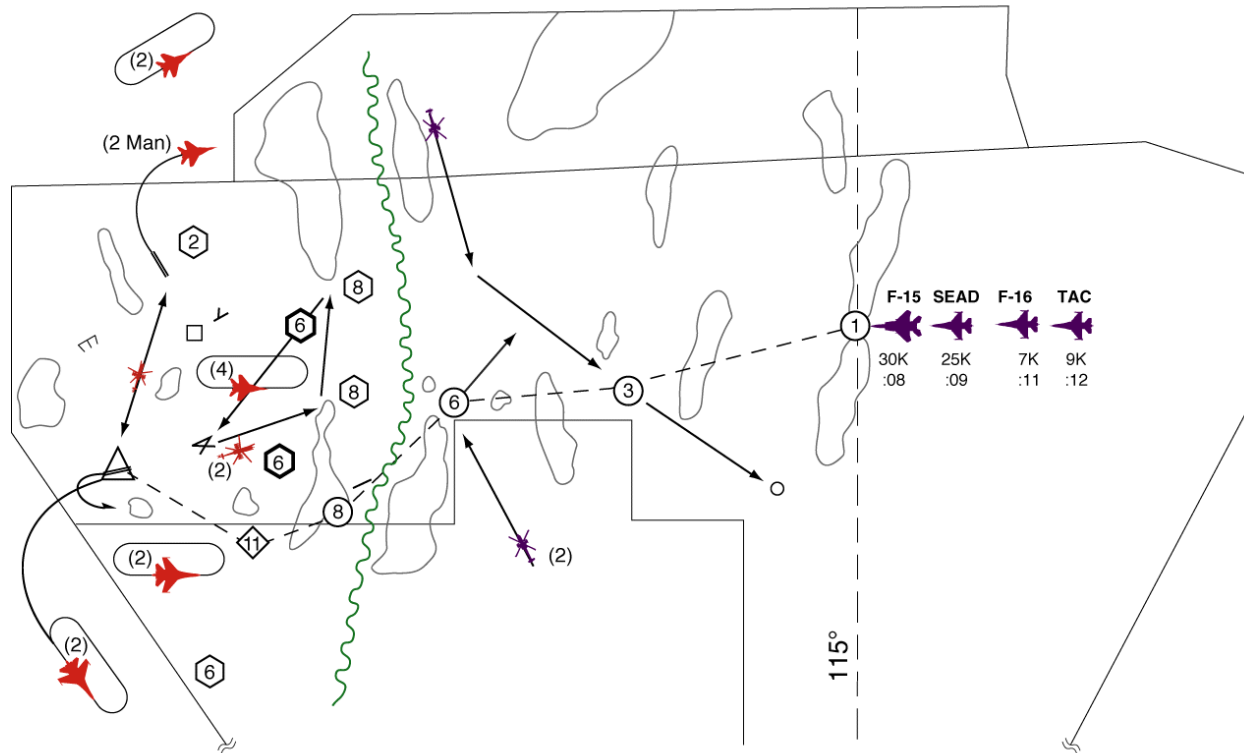


Daily Schedule

Time (DC) TBA	Time (OK) Tinker	Time (NM) TACCSF	Time (AZ) AFRL	Team A 522 FS	Team B 185 FW	Team C 523 FS
1000-1030	0900-0930	0800-0830	0700-0730	Brief Test Mission		
1030-1100	0930-1000	0830-0900	0730-0800			
1100-1130	1000-1100	0900-0930	0800-0830	Fly Test 1	Brief Test Mission	
1130-1200	1030-1100	0930-1000	0830-0900			
1200-1230	1100-1130	1000-1030	0900-0930	Debrief Test Mission	Fly Test 2	
1230-1300	1130-1200	1030-1100	0930-1000			
1300-1330	1200-1230	1100-1130	1000-1030			Brief Test Mission
1330-1400	1230-1300	1130-1200	1030-1100	Lunch break	Debrief Test Mission	Fly Test 1
1400-1430	1300-1330	1200-1230	1100-1130			
1430-1500	1330-1400	1230-1300	1130-1200	Brief OCA A-G	Lunch break	Debrief Test Mission
1500-1530	1400-1430	1300-1330	1200-1230	Fly OCA A-G		
1530-1600	1430-1500	1330-1400	1230-1300			
1600-1630	1500-1530	1400-1430	1300-1330		Brief OCA A-G	



Surface Attack Tactics Mission (Test 1 & 2)



INITIAL PICTURE

2 x MiG-29 — North CAP
4 x MiG-29 — Center CAP
2 x Su-27 — South CAP
2 x Mi-24 — Target Area

SCENARIO INPUTS

:05 — 2 x MiG-29 (Man) takeoff Tonopah
:08 — 2 x AH-64 takeoff Box
:11 — Mi-24 takeoff Tonopah
:12 — 2 x MiG-29 (Center CAP) attack
:14 — AH-64 takeoff Bear Paw
:17 — 2 x MiG-29 (Center CAP) attack
:17 — 2 x Su-27 takeoff Tolicha
:20 — 2 x MiG-29 (Man) takeoff Tonopah

TARGETS

Tolicha Airfield

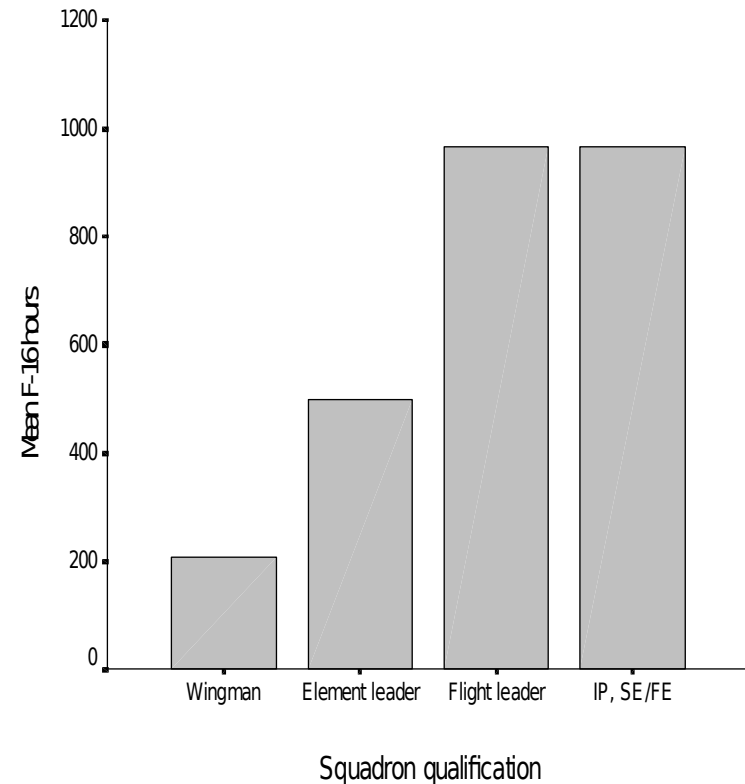
TOTs

F-16 :22
TAC :23:30



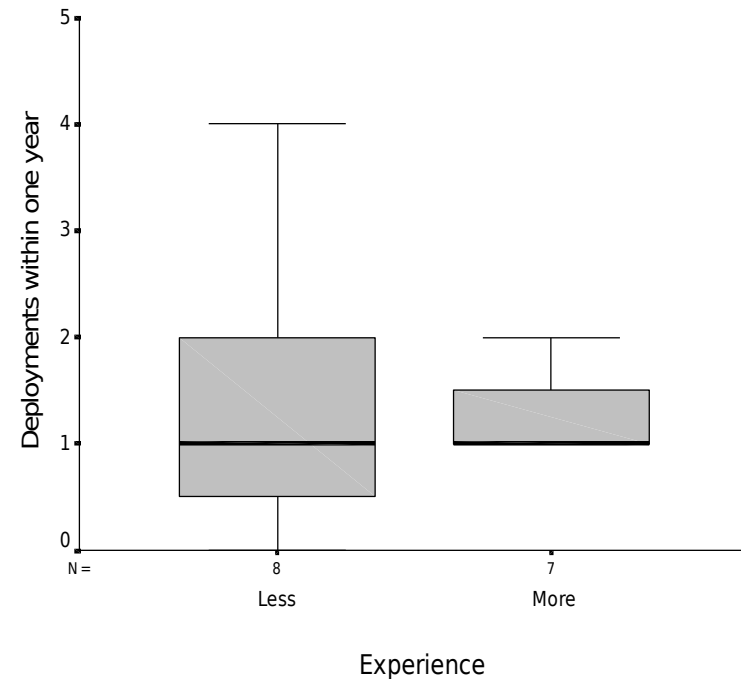
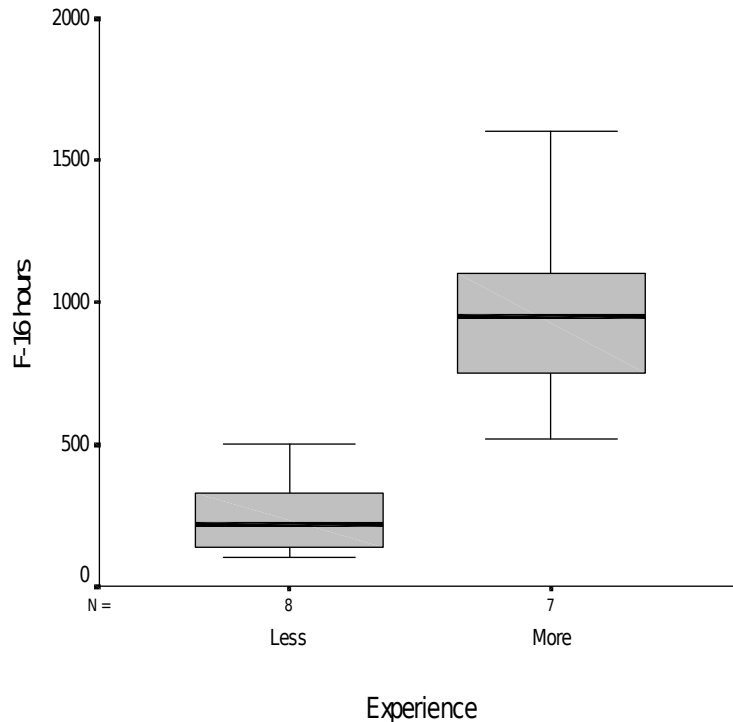
F-16 Pilots

- **Five pilots requested from each squadron:**
 - **IP / SEFE**
 - **Mission commander**
 - **4 or 2-ship flight lead**
 - **MR wingman**
 - **MR wingman**





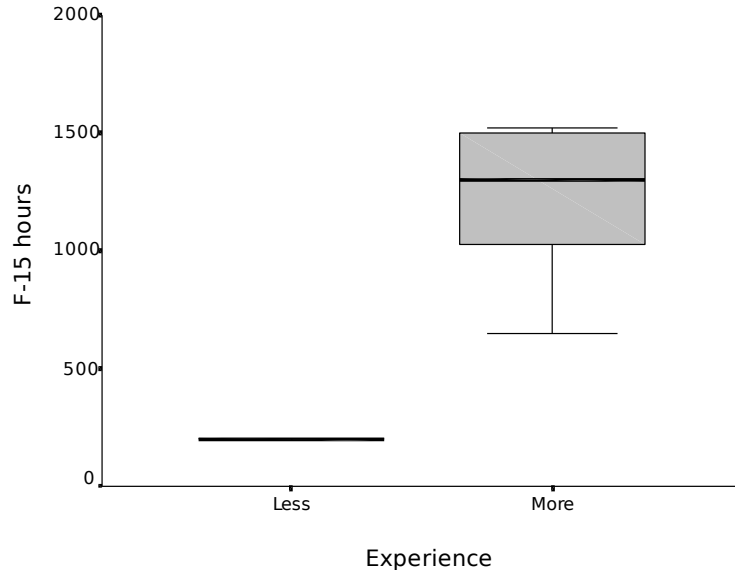
F-16 Pilot Experience



F-16 hours for more and less experienced pilots Deployments for more and less experienced pilots



Other Roadrunner Participants



F-15 hours for more and less experienced pilots

- **Three AWACS teams**
 - **One WD served as lead with the other as support**
 - **WDs alternated lead and support roles**
- **Squadrons provided one more experiences WD and one less experienced--Team C:**
 - **500 flight hours**
 - **120 flight hours**



Exercise Summary

- **24 scheduled missions**
 - **No aborts, some delayed starts--all missions completed on schedule**
 - **Communication problems with AWACS Mon and Tue**
 - **Corrected failures on F-16 cockpit: 2 missions**
 - **Hard failures on F-16 cockpit: 2 missions**

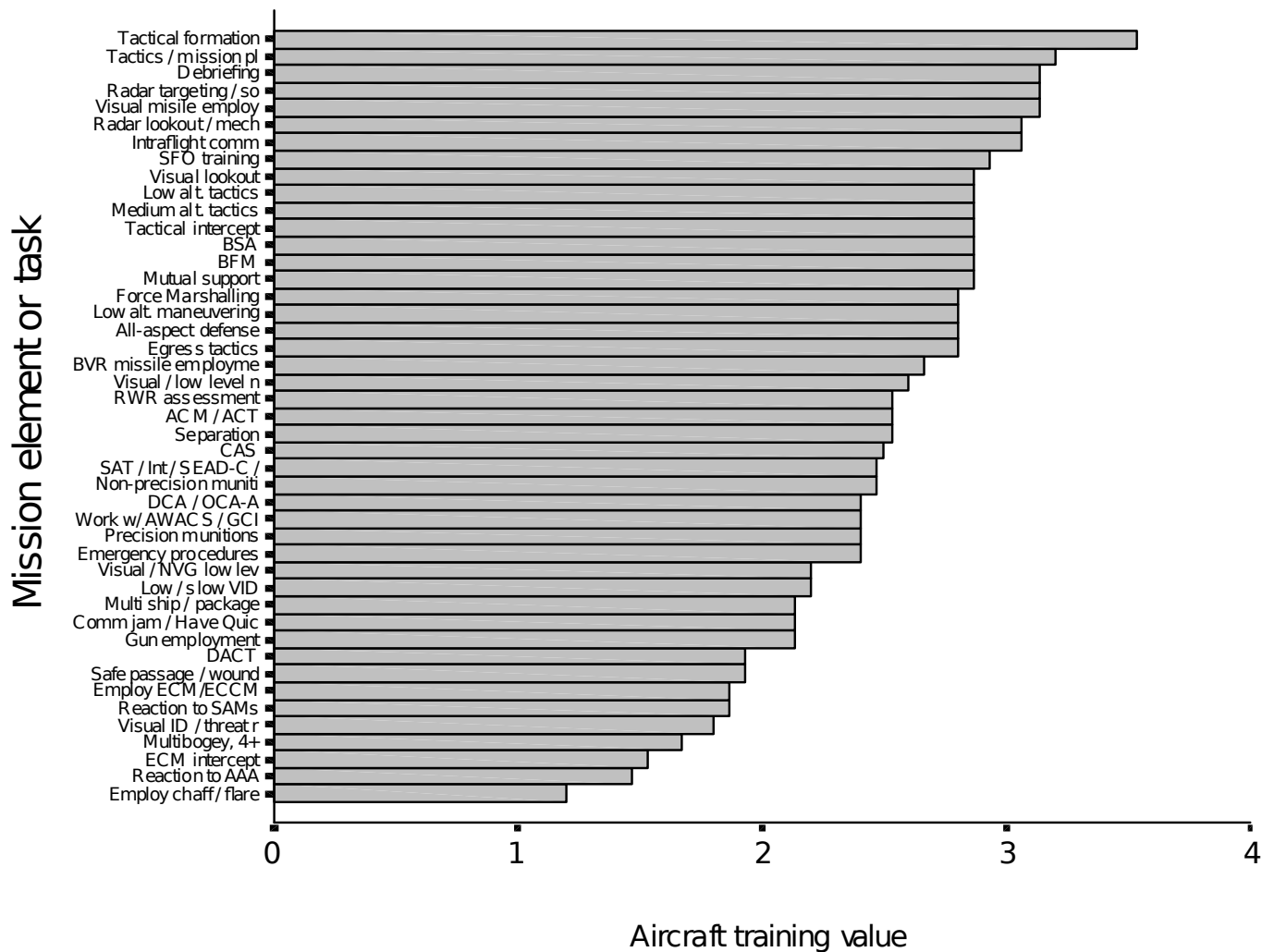


Questionnaire Data

- **Rating of aircraft training effectiveness for 45 mission tasks and elements--completed before familiarization ride**
 - **0 = Negative training for combat; aircraft training reduces combat readiness**
 - **4 = Total positive training; aircraft training is equivalent to combat experience**
- **Rating of DMT training--completed after last mission**
 - **0 = Negative training ; DMT training reduces combat readiness for this task**
 - **4 = Total positive training; DMT training is equivalent to combat experience**

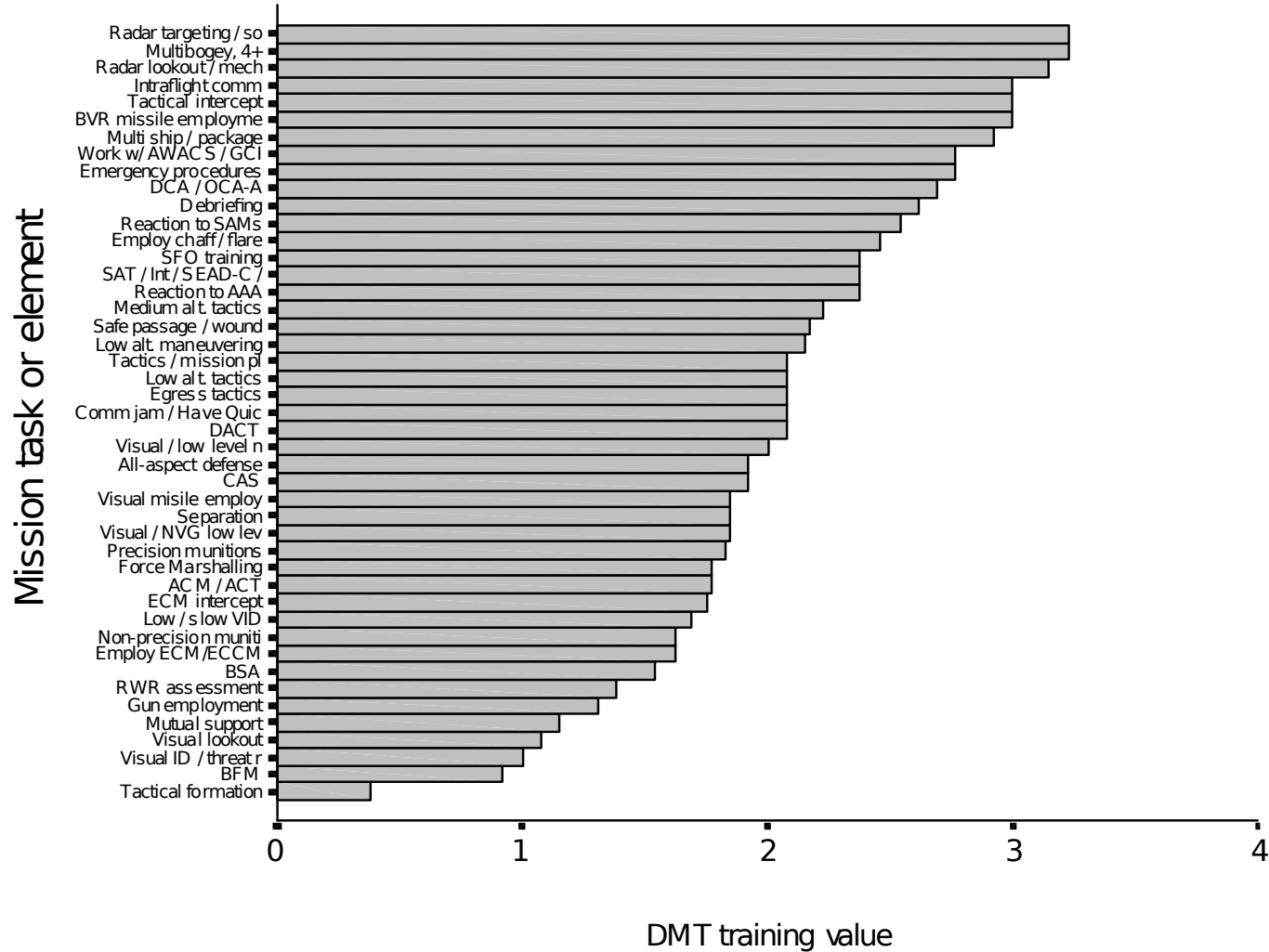


F-16 Pilot Ratings for Aircraft Training



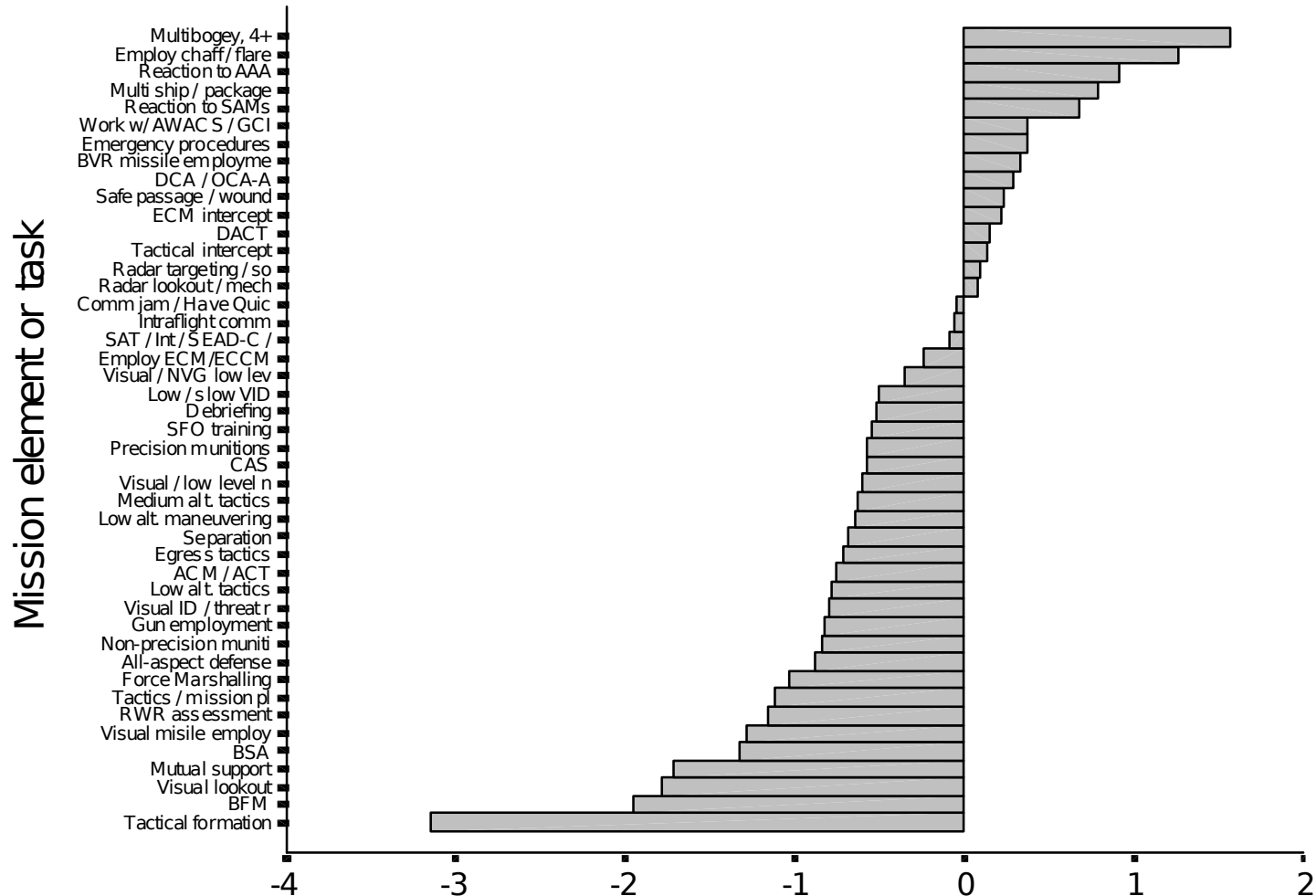


F-16 Pilot Ratings for DMT



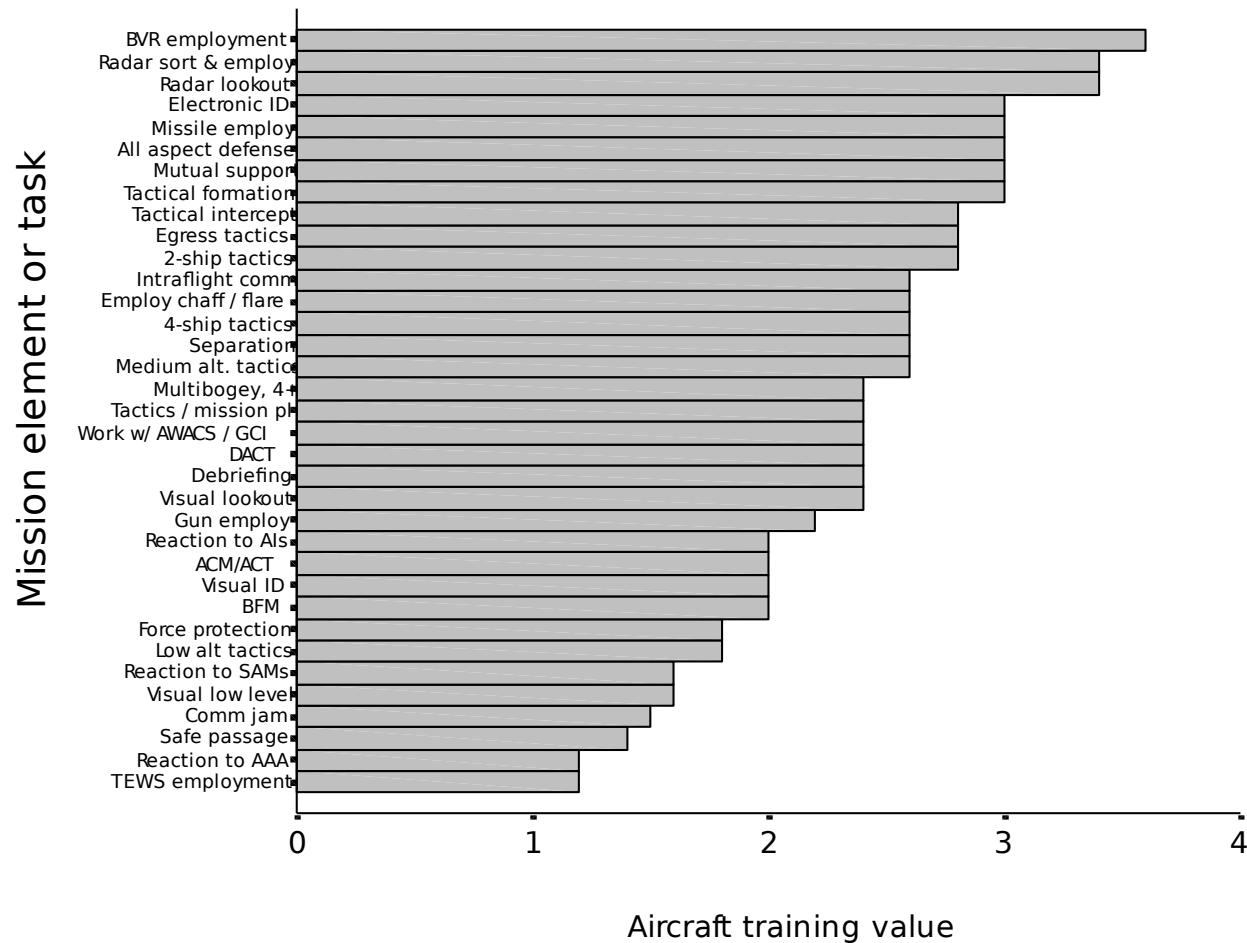


Comparison of F-16 Pilot Ratings for DMT and Aircraft Training



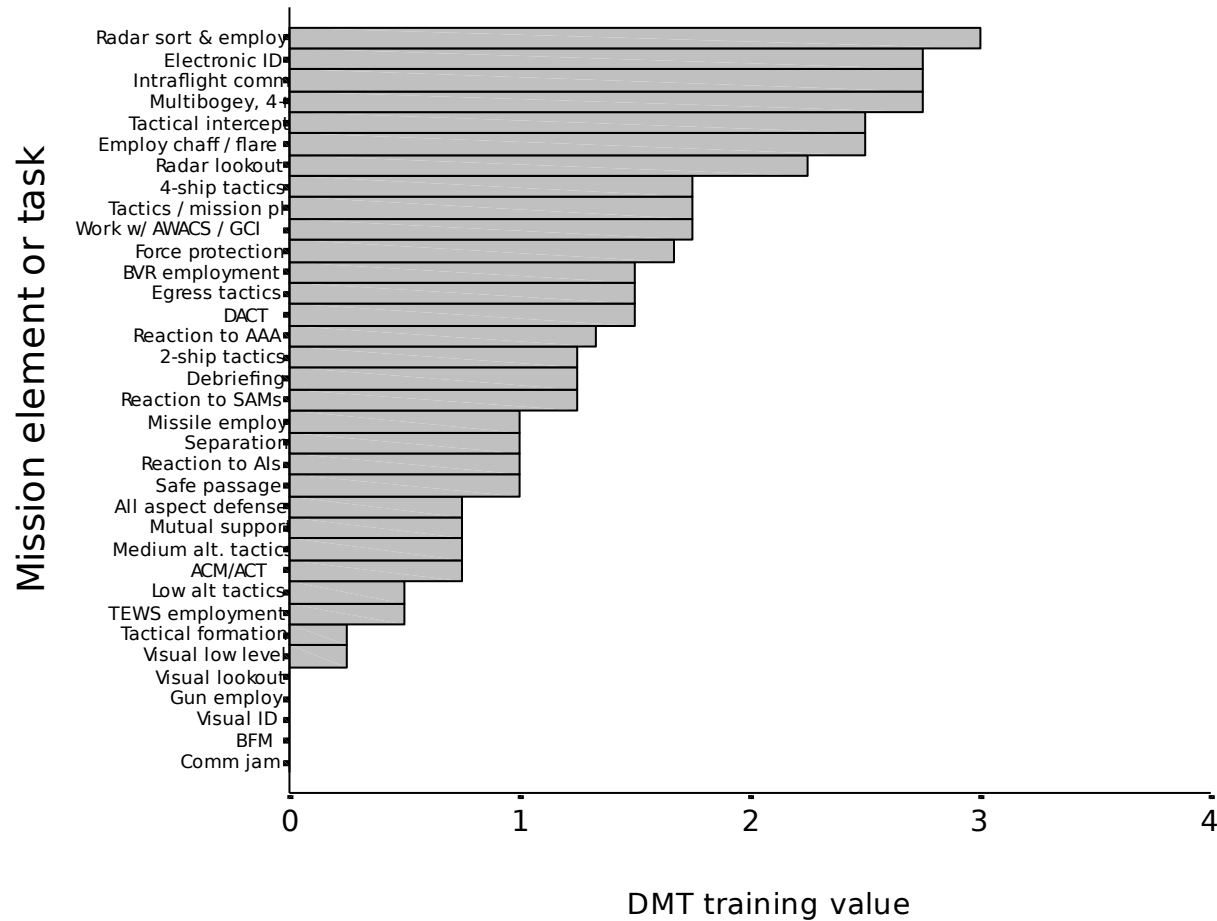


F-15 Pilot Ratings for Aircraft Training



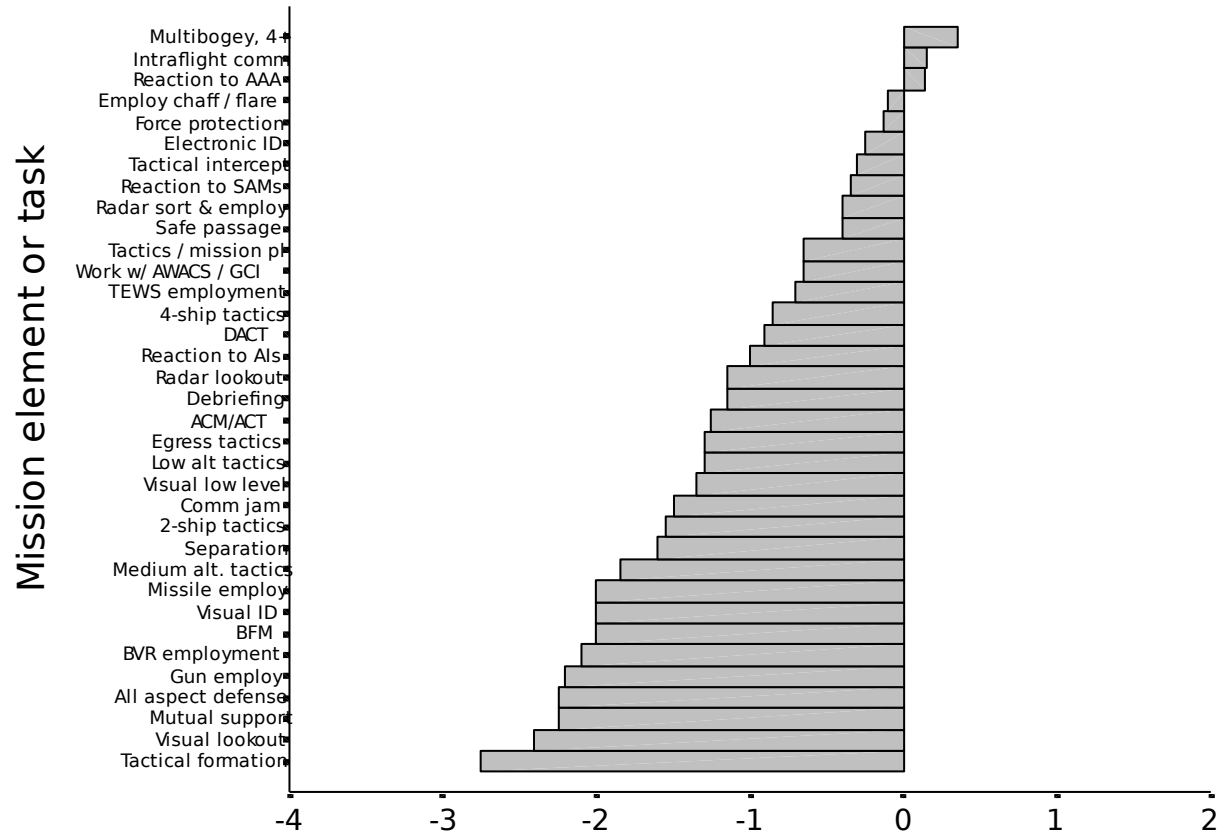


F-15 Pilot Ratings for DMT





Comparison of F-15 Pilot Ratings for DMT and Aircraft Training



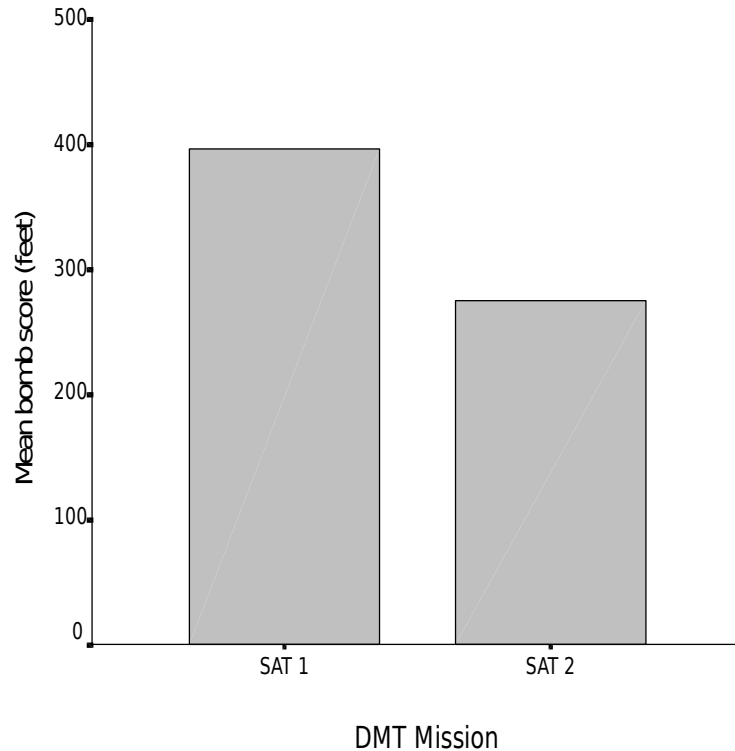


F-16 SAT 1 (Tue) vs. SAT 2 (Fri)

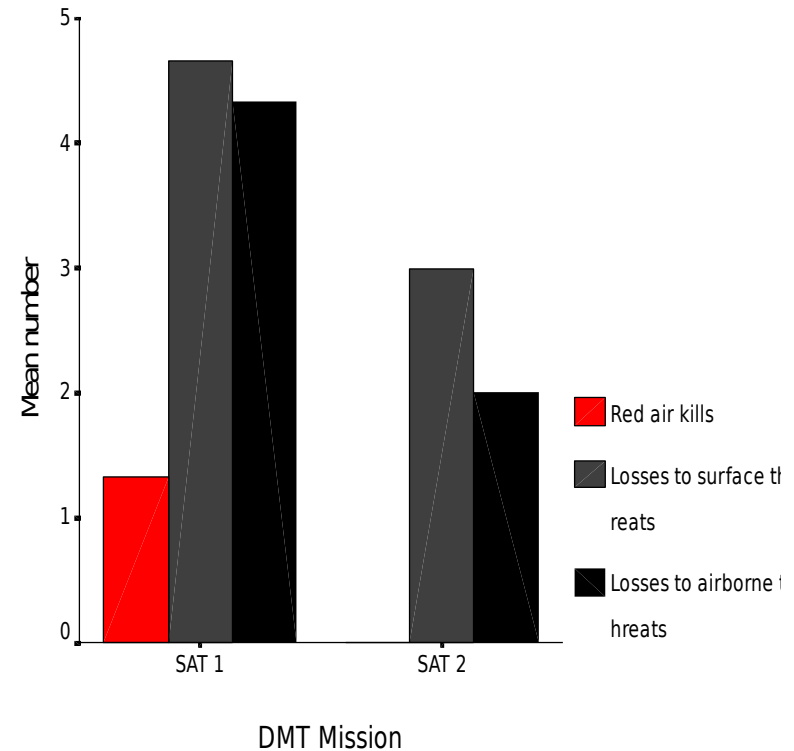
- **Bomb score / kills / losses**
- **Teamwork Observation Measurement Scales (TOMS) developed by NAWC-TSD**
 - **Overall mission grade**
 - **Communication**
 - **Situation Awareness**
 - **Adaptability / Flexibility**
 - **Crew Coordination**
- **Instructor pilot rating**
 - **1 = Unable to perform or dangerous**
 - **3 = Nominal performance**
 - **5 = Extraordinary performance**



F-16 Bomb score / Kills / Losses



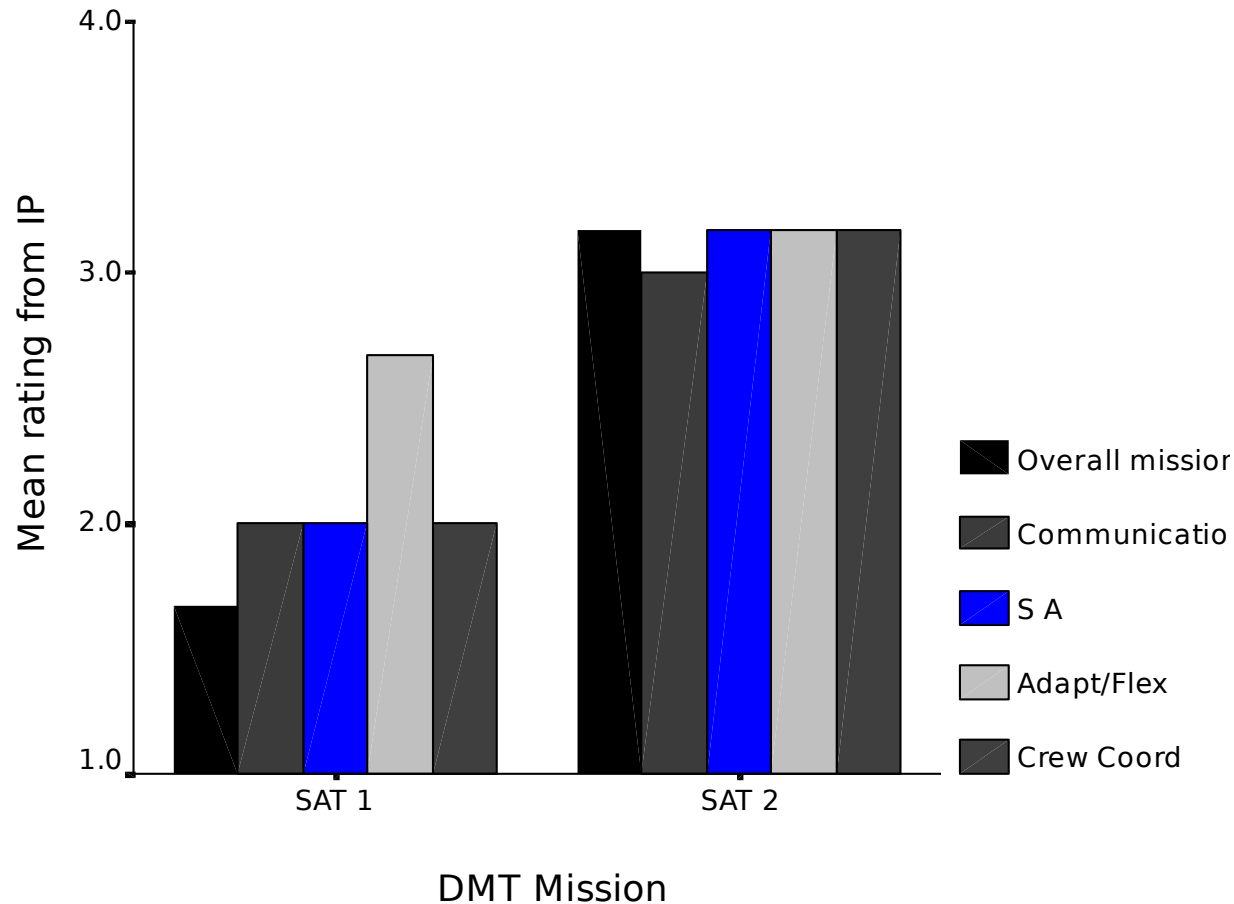
Bomb scores for test missions



Kills and losses for test missions



F-16 TOMS ratings from IP



Instructor ratings for test missions



Comments and Critiques

- **Technology problems**
 - **Communication with AWACS**
 - **Visual displays**
 - **Constructive forces**
- **Procedure problems**
 - **Time lines**
 - **Brief / debrief**
- **Best use of DMT**
 - **Intensive training--many rides in few days**
 - **Multi-ship, multi-bogey air-to-air with AWACS**
 - **Follow-up at Red Flag**



Comments and Critiques

“This is really going to save me lots of money. It is going to give me realistic training and decrease the time it is going to take me to experience a guy who is ready to go out on the road by himself.

It will make us a lot more efficient”

**Col Charles Winstead
Vice Commander
522 ACW, Tinker AFB**



Roadrunner Objectives

- **Document DMT technical capabilities necessary for combat mission training**
 - **System successes and shortfalls**
 - **Exercise development and management**
- **Validate research approach for DMT training effectiveness studies**
 - **Robust effects and sensitive measures**
 - **Relate performance to process**
 - **Develop and evaluate training strategies that take advantage of the unique capabilities of DMT**